CLAIMS

What is claimed is:

1. A method for hermetically sealing a post media-filled micro-electro-mechanical system (MEMS) package, comprising the steps of:

filling a MEMS package through a fill port with at least one medium;

plugging the fill port in the MEMS package with a sealant; and

depositing a metal cap in a specific pattern over the sealant to hermetically seal the fill port.

2. The method of claim 1, wherein the step of filling the MEMS package includes the more specific step of filling the MEMS package through the fill port that is a through hole located in a lid.

3. The method of claim 1, wherein the step of filling a MEMS package includes the more specific step of filling the MEMS package through the fill port that is a break in a bond ring.

4. The method of claim 1, wherein the step of filling a MEMS package includes the more specific step of filling the MEMS package with at least one medium from the group consisting of air, oxygen, nitrogen, argon, a low vapor pressure oil, a lubricant, a hydrophobic fluid, and sol gel.

5. The method of claim 1, wherein the step of filling a MEMS package includes the more specific step of evacuating the MEMS package atmosphere to create a vacuum.

6. The method of claim 1, wherein the step of plugging the fill port includes the more specific step of plugging the fill port with an organic sealant.

7. The method of claim 6, wherein the step of plugging the fill port with an organic sealant includes the more specific step of placing one or more sealants within the fill hole, wherein the sealant is an organic sealant selected from the group consisting of thermal-set epoxy, UV curable epoxy, two-part epoxy, silicone, and spin-on polyamides.

8. The method of claim 1, wherein the step of plugging the fill port includes the more specific step of plugging the fill port with an inorganic sealant.

9. The method of claim 1, further comprising the step of curing the sealant used in plugging the fill port.

10. The method of claim 9, wherein the step of curing the sealant includes the more specific step of curing the sealant with a curing agent.

11. The method of claim 9, wherein the step of curing the sealant includes the more specific step of curing the sealant with a curing agent from the group consisting of ethylene amines and cycloaliphatics.

12. The method of claim 9, wherein the step of curing the sealant includes the more specific step of curing the sealant with using a vacuum.

13. The method of claim 1, further comprising the step of cleaning the MEMS package.

14. The method of claim 1, wherein the step of depositing a metal cap over the sealant includes the more specific step of depositing a metal film on top of the sealant through a shadow mask, wherein the shadow mask defines a specific pattern.

15. The method of claim 1, wherein the step of depositing a metal cap over the sealant includes the more specific step of depositing a metal film in a specific pattern on top of the sealant using an electron beam through a shadow mask, wherein the shadow mask defines a specific pattern.

16. The method of claim 1, wherein the step of depositing a metal cap over the sealant includes the more specific step of depositing a metal film in a specific pattern on top of the sealant using physical vapor deposition through a shadow mask.

17. A micro-electro-mechanical system (MEMS) package for hermetically sealing a MEMS device, comprising:

the MEMS package having a fill port, wherein the fill port is a through hole capable of having at least one medium inserted through the fill port.

at least one sealant placed within the fill port wherein the at least one sealant substantially fills the fill port; and

a metal cap placed over the at least one sealant in a specific pattern wherein the metal cap substantially hermetically seals the fill port.

18. A MEMS package as in claim 17, further comprising a MEMS device placed within the MEMS package.

19. A MEMS package as in claim 18, further comprising a bond ring surrounding the MEMS device.

20. A MEMS package as in claim 19, wherein the fill port is located in a break in the bond ring.

21. A MEMS package as in claim 17, further comprising a lid disposed above the bond ring.

22. A MEMS package as in claim 21, wherein the fill port is a through-hole located in the lid.

23. A MEMS package as in claim 21, wherein the lid is selected from the group of materials consisting of glass and silicon.

24. A MEMS package as in claim 17, wherein the one or more sealants placed within the fill hole is an organic sealant selected from the group consisting of thermal-set epoxy, UV curable epoxy, two-part epoxy, silicone, and spin-on polyamides.

25. A MEMS package as in claim 17, wherein the at least one sealant is an inorganic sealant.

26. A MEMS package as in claim 17, wherein the at least one medium is a gas selected from the group of media consisting of air, nitrogen, oxygen, and argon.

27. A MEMS package as in claim 17, wherein the at least one medium is a liquid selected from the group of liquid media consisting of a low vapor pressure oil, a lubricant, and a hydrophobic fluid.

28. A MEMS package as in claim 27, wherein the liquid refractive index is similar to a lid refractive index.

29. A MEMS package as in claim 27, wherein the liquid has a coefficient of thermal expansion similar to that of the MEMS device.

30. A MEMS package as in claim 17, wherein the at least one medium is a solid selected from the group of solid media consisting of sol gel.

31. A MEMS package as in claim 17, wherein the at least one sealant is cured using a low temperature curing process and the MEMS package is cleaned.

32. A MEMS package as in claim 17, wherein the metal cap is formed over the at least one sealant using a low temperature process selected from the group consisting of electron beam deposition and physical vapor deposition.

33. A MEMS package as in claim 17, comprising a metal cap made from one or more types of metal, said one or more types of metal selected from the group

consisting of gold, titanium, silver, aluminum, chromium, and tantalum.

34. A micro-electro-mechanical system (MEMS) package for hermetically sealing a MEMS device, comprising:

a means for filling a MEMS package through a fill port with at least one medium;

a means for plugging the fill port in the MEMS package with at least one sealant; and

a means for hermetically sealing a metal cap in a specific pattern over the at least one sealant.